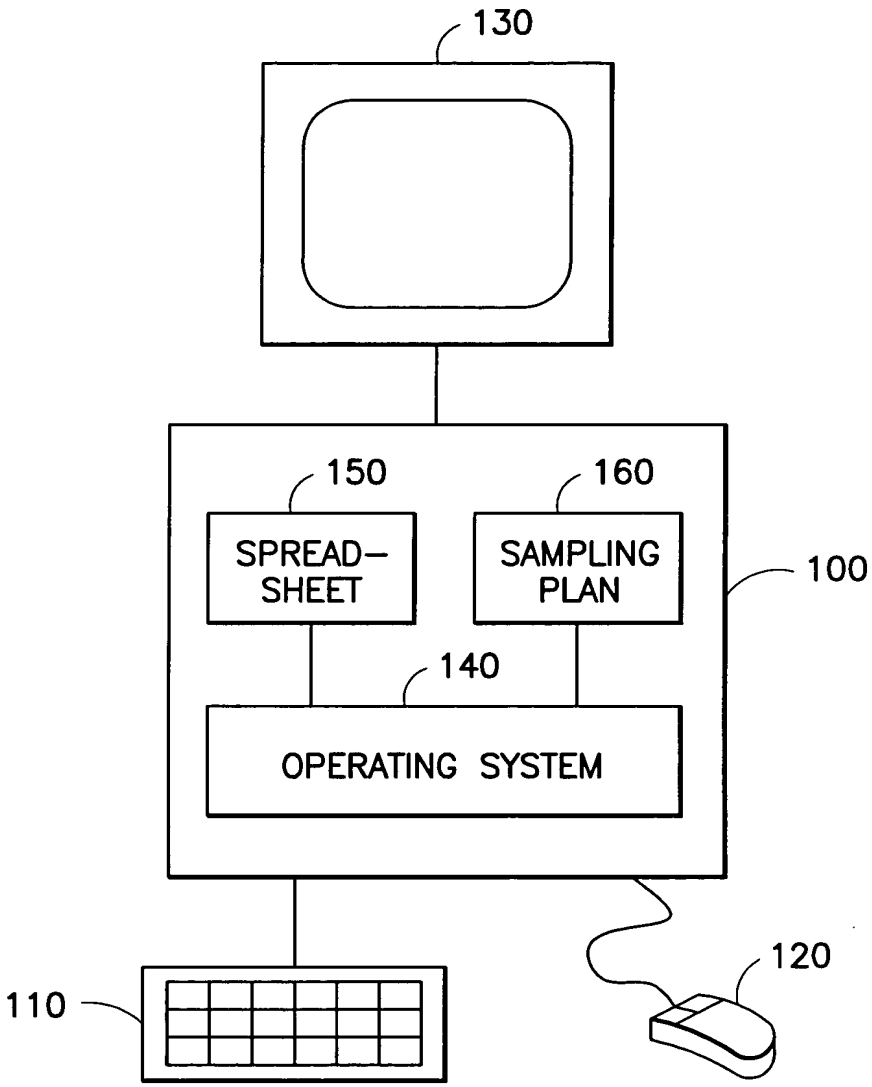
130
150
160
SPREAD–
SHEET
SAMPLING
PLAN
100
140
OPERATING SYSTEM
110
120

FIG. 1

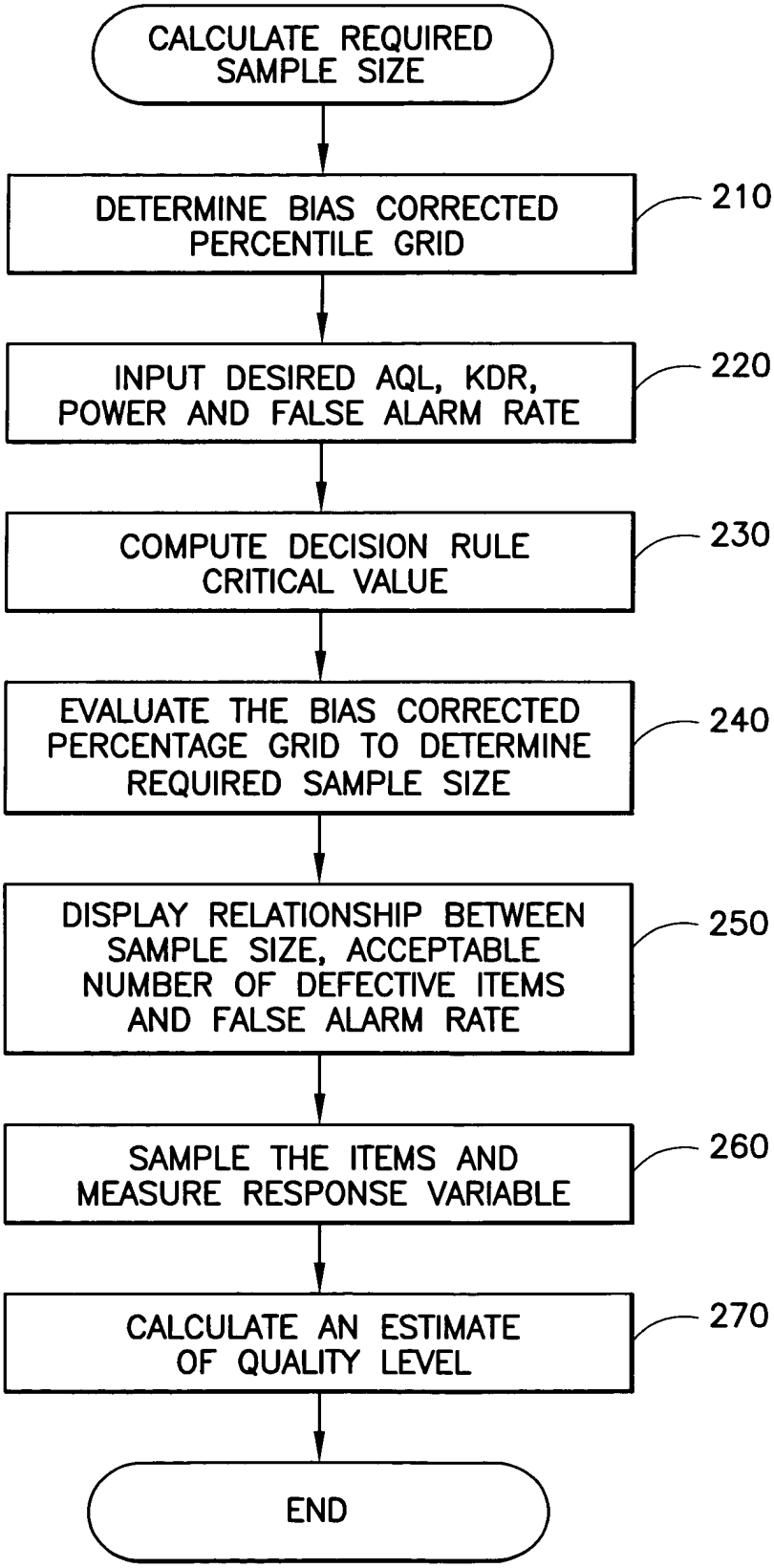
CALCULATE REQUIRED SAMPLE SIZE
DETERMINE BIAS CORRECTED PERCENTILE GRID
210
INPUT DESIRED AQL, KDR, POWER AND FALSE ALARM RATE
220
COMPUTE DECISION RULE CRITICAL VALUE
230
EVALUATE THE BIAS CORRECTED PERCENTAGE GRID TO DETERMINE REQUIRED SAMPLE SIZE
240
DISPLAY RELATIONSHIP BETWEEN SAMPLE SIZE, ACCEPTABLE NUMBER OF DEFECTIVE ITEMS AND FALSE ALARM RATE
250
SAMPLE THE ITEMS AND MEASURE RESPONSE VARIABLE
260
CALCULATE AN ESTIMATE OF QUALITY LEVEL
270
END

FIG.2

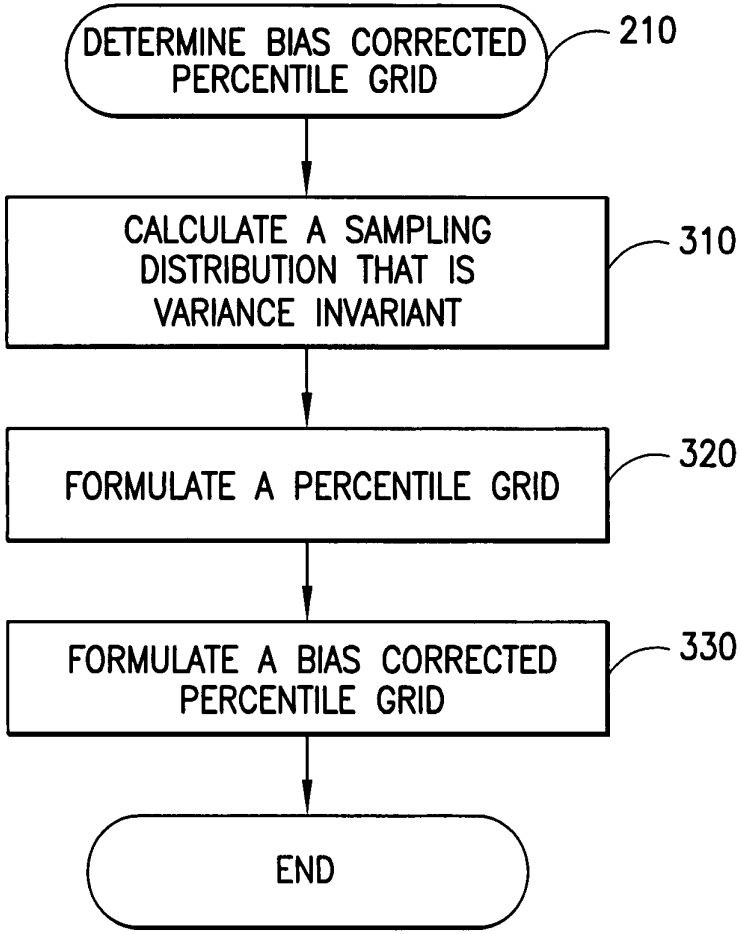
DETERMINE BIAS CORRECTED PERCENTILE GRID
210
CALCULATE A SAMPLING DISTRIBUTION THAT IS VARIANCE INVARIANT
310
FORMULATE A PERCENTILE GRID
320
FORMULATE A BIAS CORRECTED PERCENTILE GRID
330
END

FIG.3

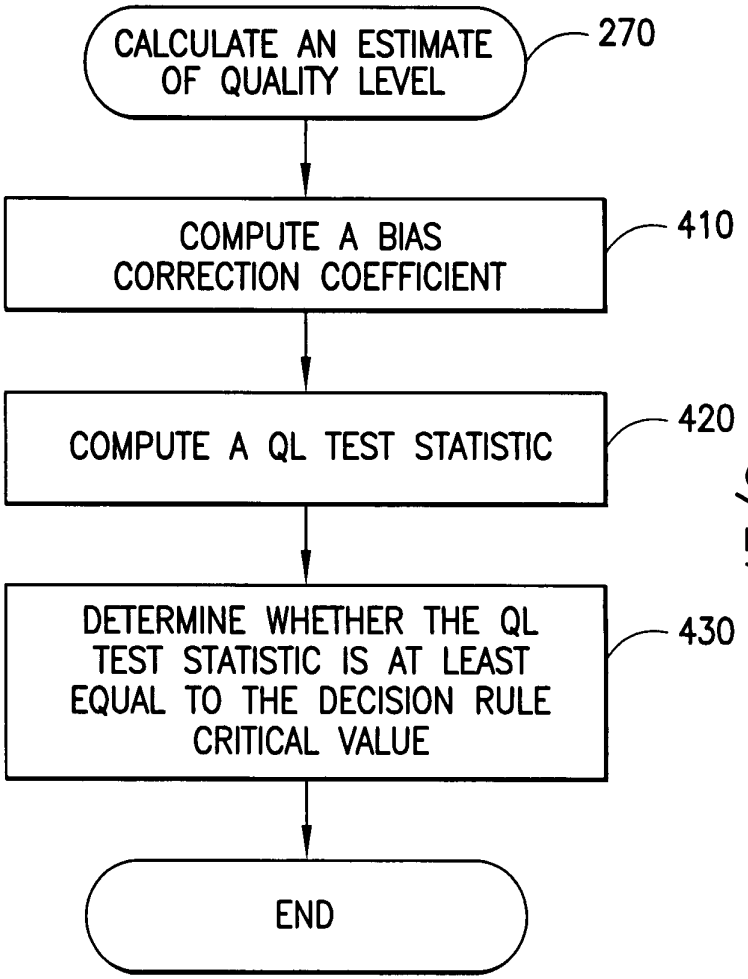
CALCULATE AN ESTIMATE OF QUALITY LEVEL
270
COMPUTE A BIAS CORRECTION COEFFICIENT
410
COMPUTE A QL TEST STATISTIC
420
DETERMINE WHETHER THE QL TEST STATISTIC IS AT LEAST EQUAL TO THE DECISION RULE CRITICAL VALUE
430
END

FIG.4

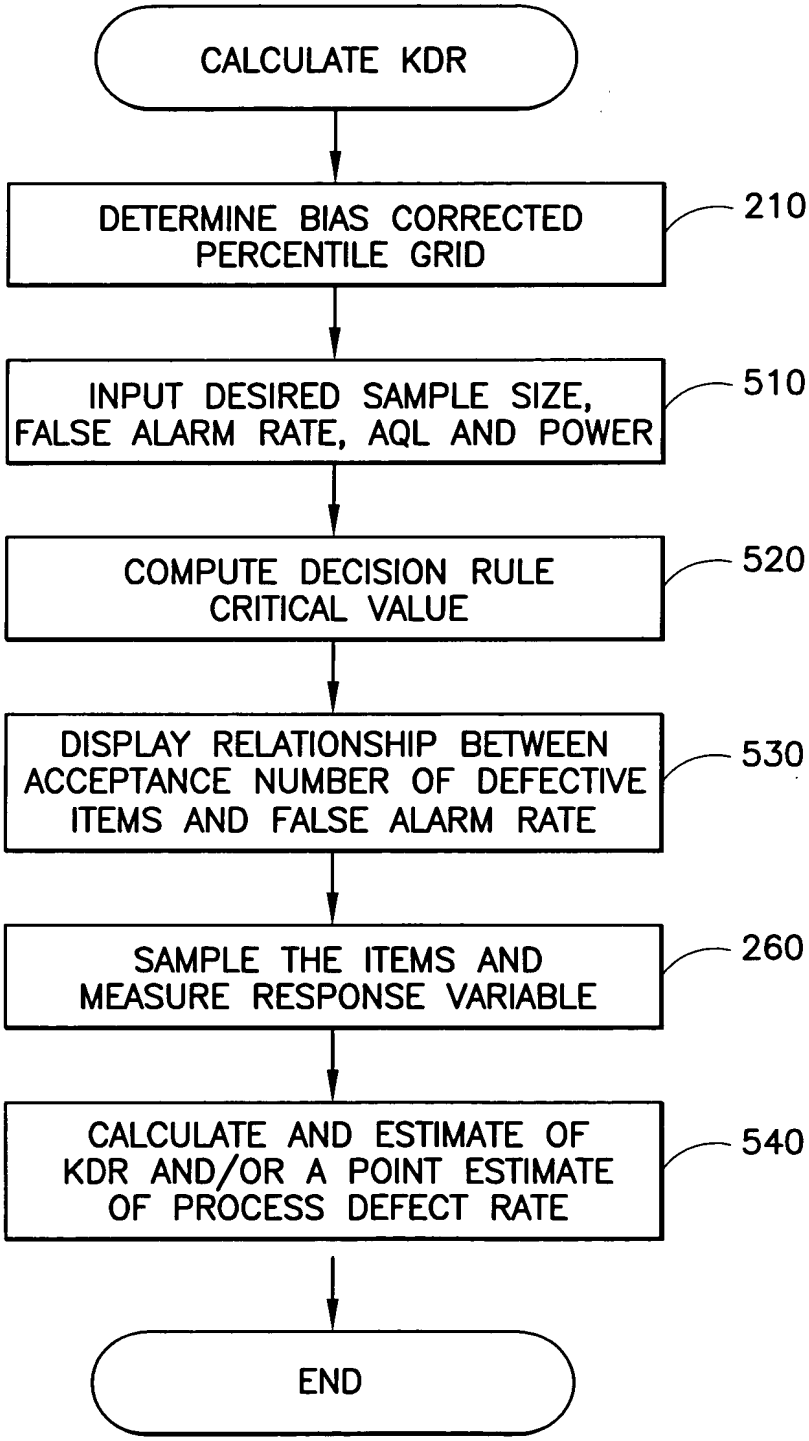
CALCULATE KDR
DETERMINE BIAS CORRECTED PERCENTILE GRID
210
INPUT DESIRED SAMPLE SIZE, FALSE ALARM RATE, AQL AND POWER
510
COMPUTE DECISION RULE CRITICAL VALUE
520
DISPLAY RELATIONSHIP BETWEEN ACCEPTANCE NUMBER OF DEFECTIVE ITEMS AND FALSE ALARM RATE
530
SAMPLE THE ITEMS AND MEASURE RESPONSE VARIABLE
260
CALCULATE AND ESTIMATE OF KDR AND/OR A POINT ESTIMATE OF PROCESS DEFECT RATE
540
END

FIG.5

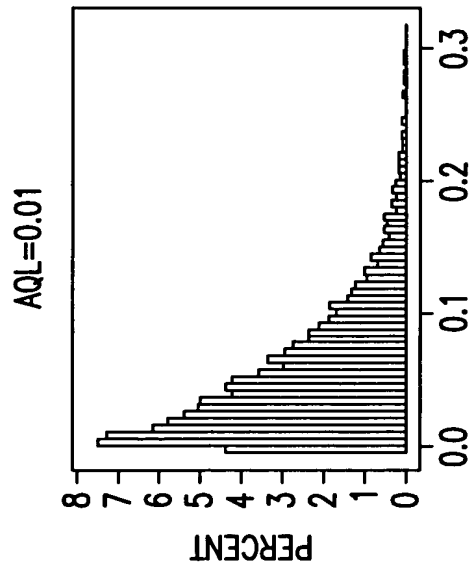

FIG.6A

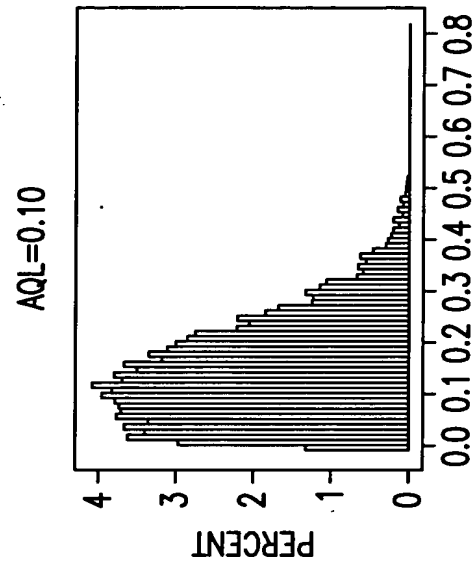

FIG.6B

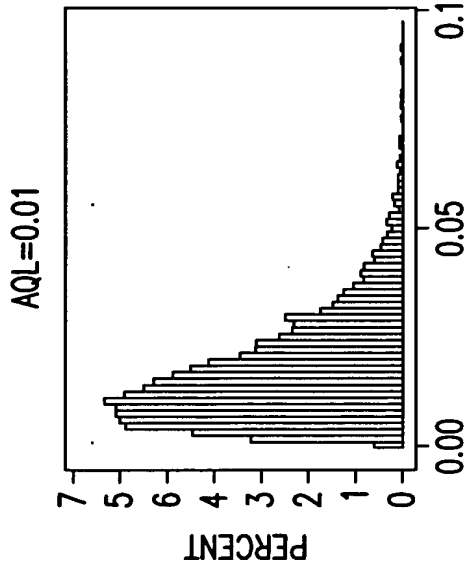

FIG.6C

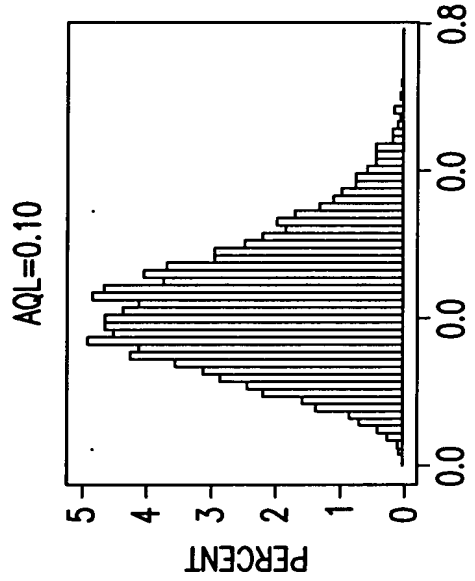

FIG.6D

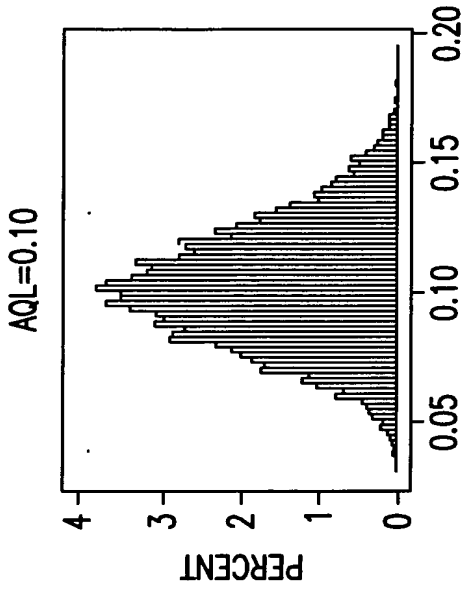
AQL=0.10
PERCENT
0
1
2
3
4
0.05
0.10
0.15
0.20
n=100

FIG.6F

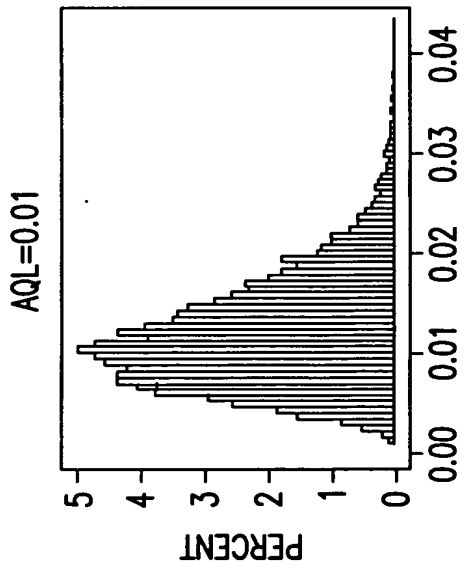
AQL=0.01
PERCENT
0
1
2
3
4
5
0.00
0.01
0.02
0.03
0.04
n=100

FIG.6E

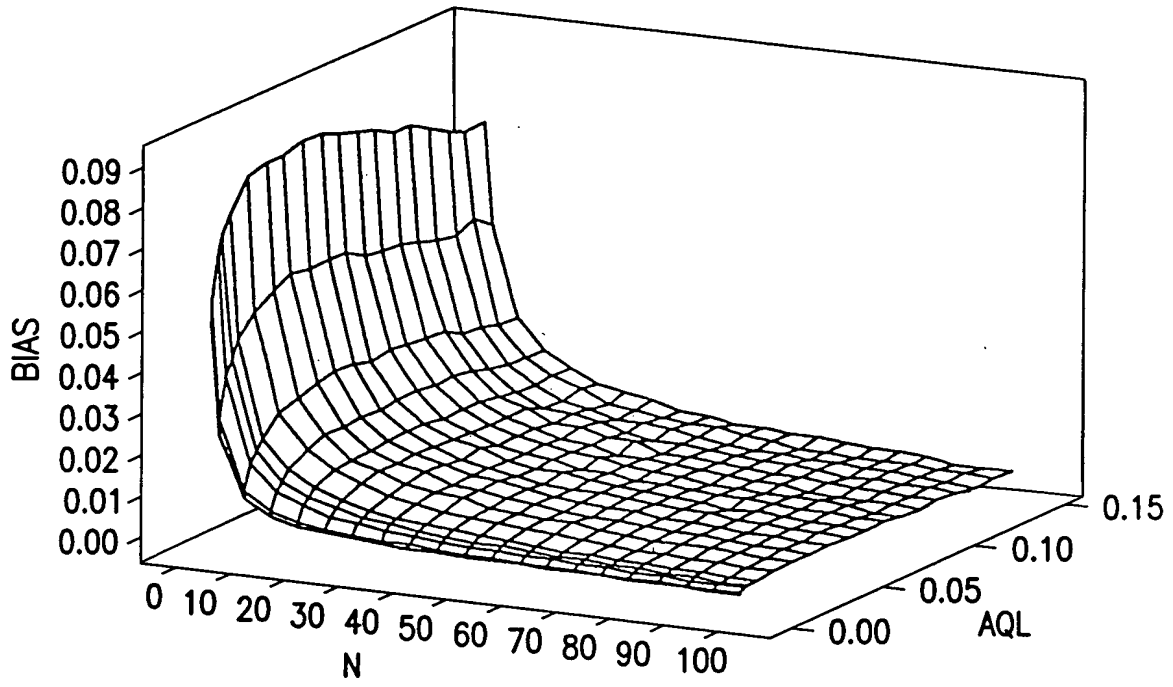
BIAS
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0 10 20 30 40 50 60 70 80 90 100
N
0.00
0.05
0.10
0.15
AQL

FIG.7

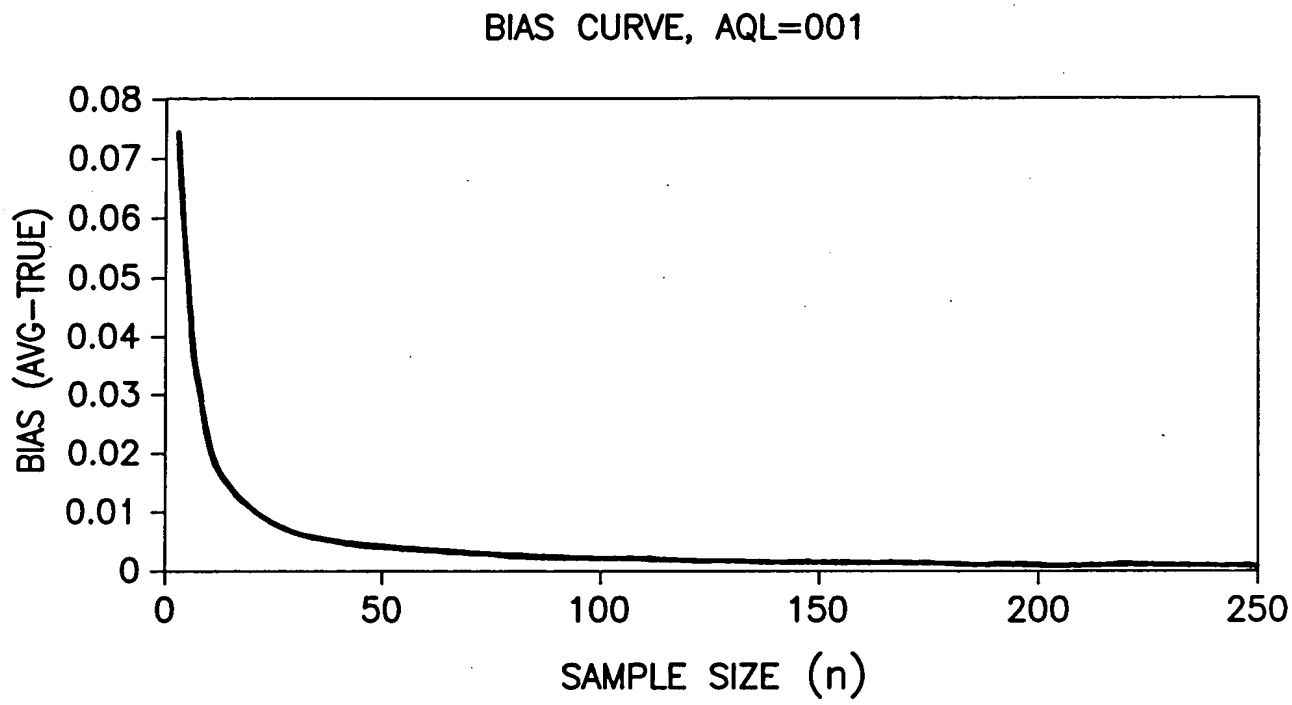
BIAS CURVE, AQL=001
BIAS (AVG-TRUE)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
50
100
150
200
250
SAMPLE SIZE (n)

FIG.8A

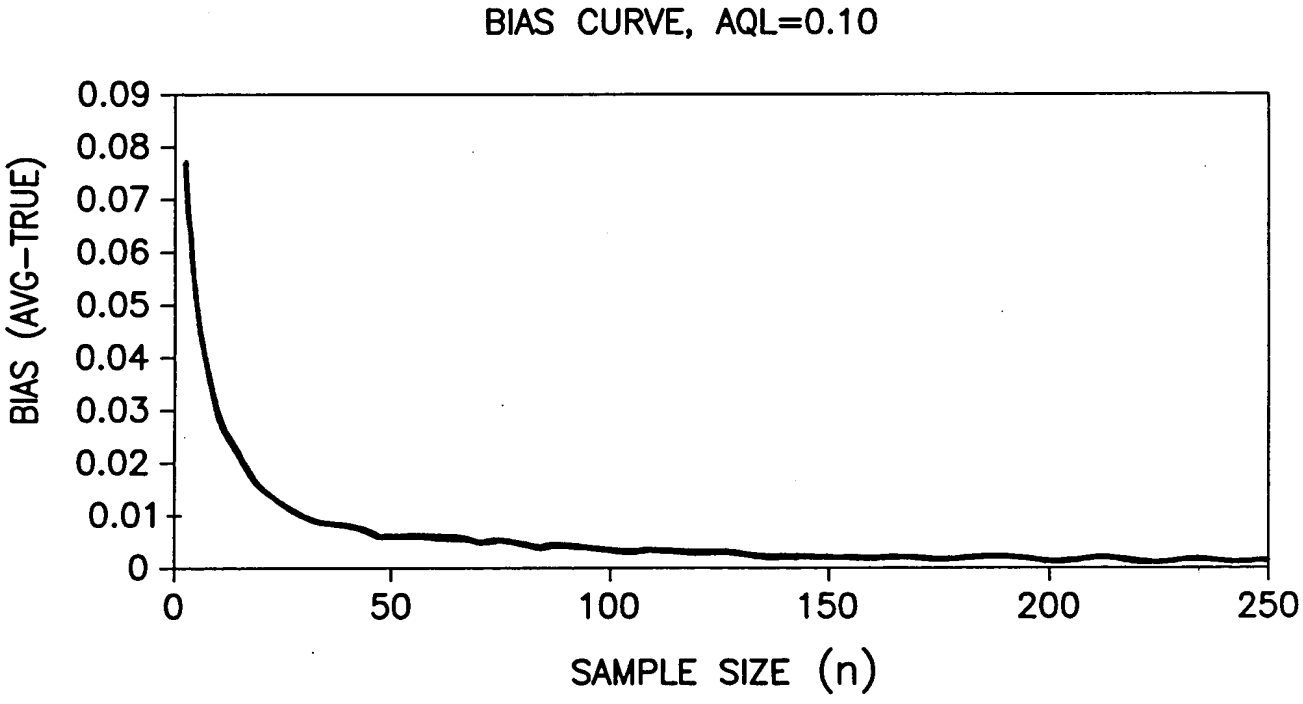
BIAS CURVE, AQL=0.10
BIAS (AVG-TRUE)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
50
100
150
200
250
SAMPLE SIZE (n)

FIG.8B

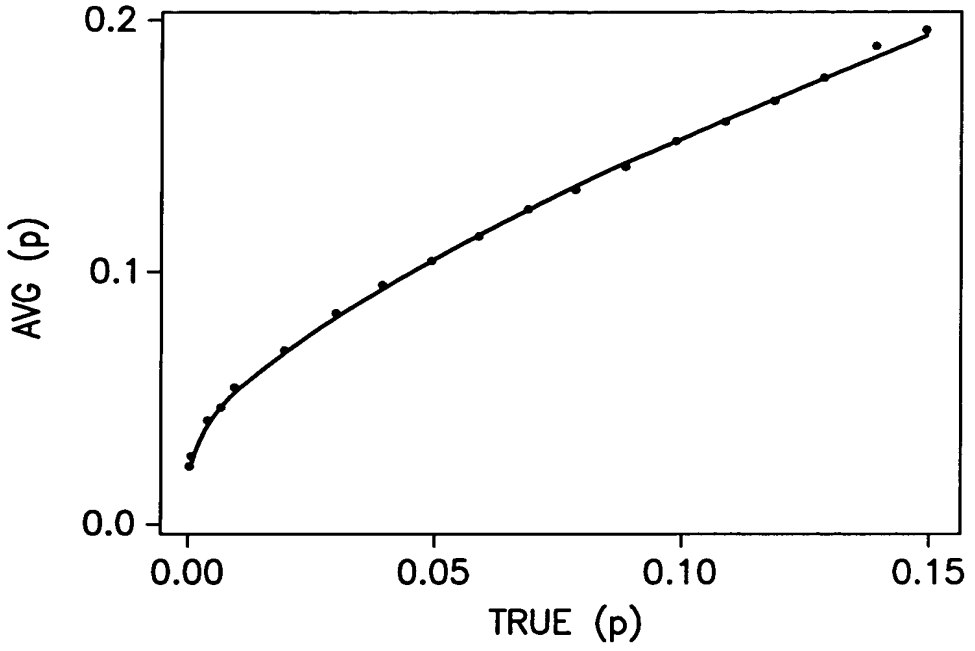
0.2
0.1
0.0
AVG (p)
0.00
0.05
0.10
0.15
TRUE (p)

FIG.9A

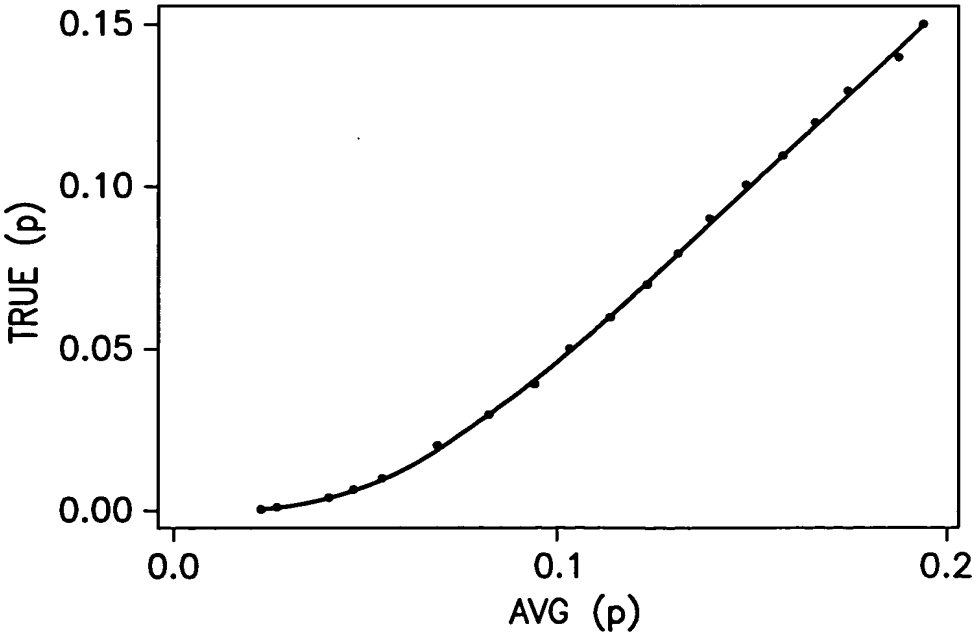
0.15
0.10
0.05
0.00
TRUE (p)
0.0
0.1
0.2
AVG (p)

FIG.9B

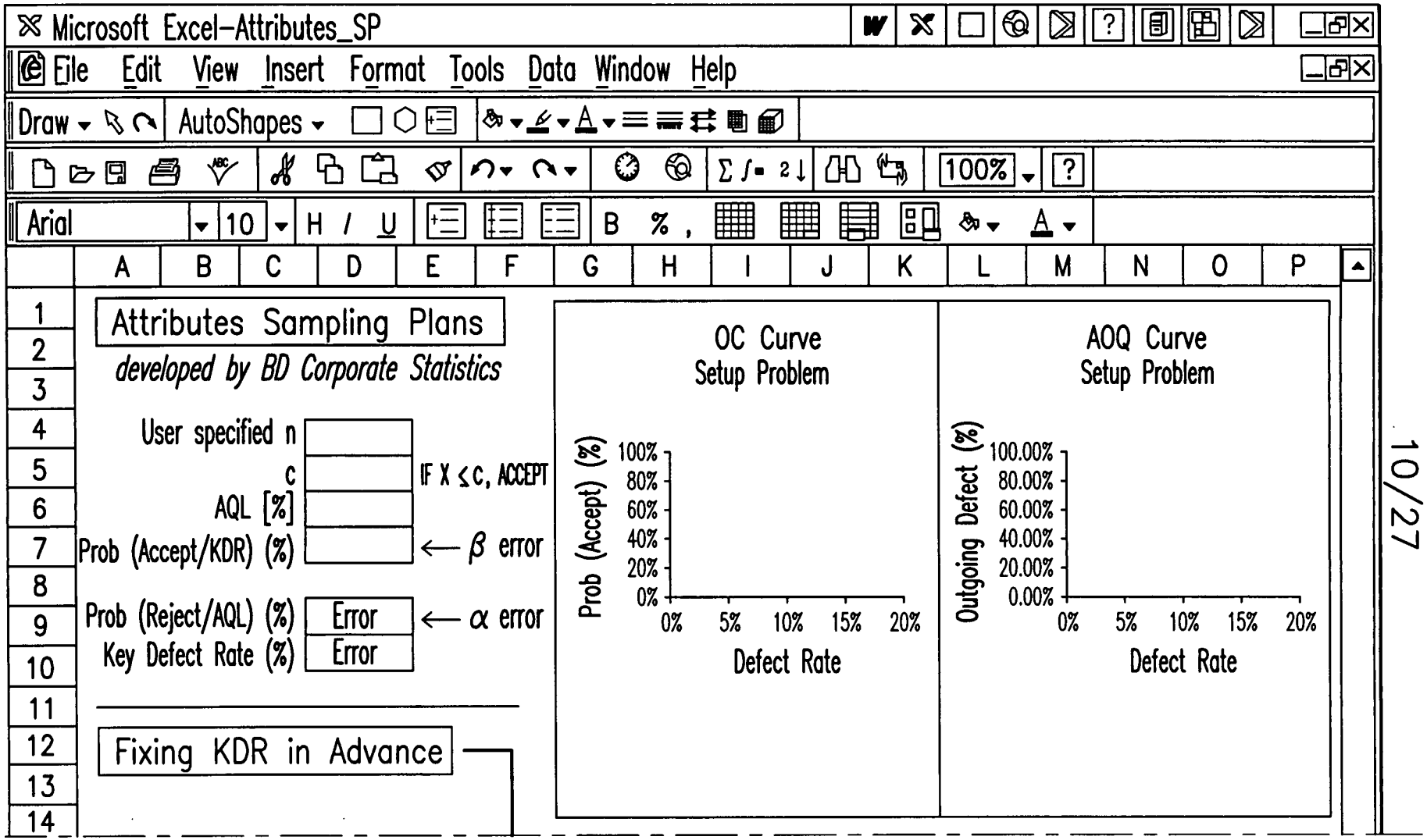

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FIG.10A
FIG.10B

FIG.10A

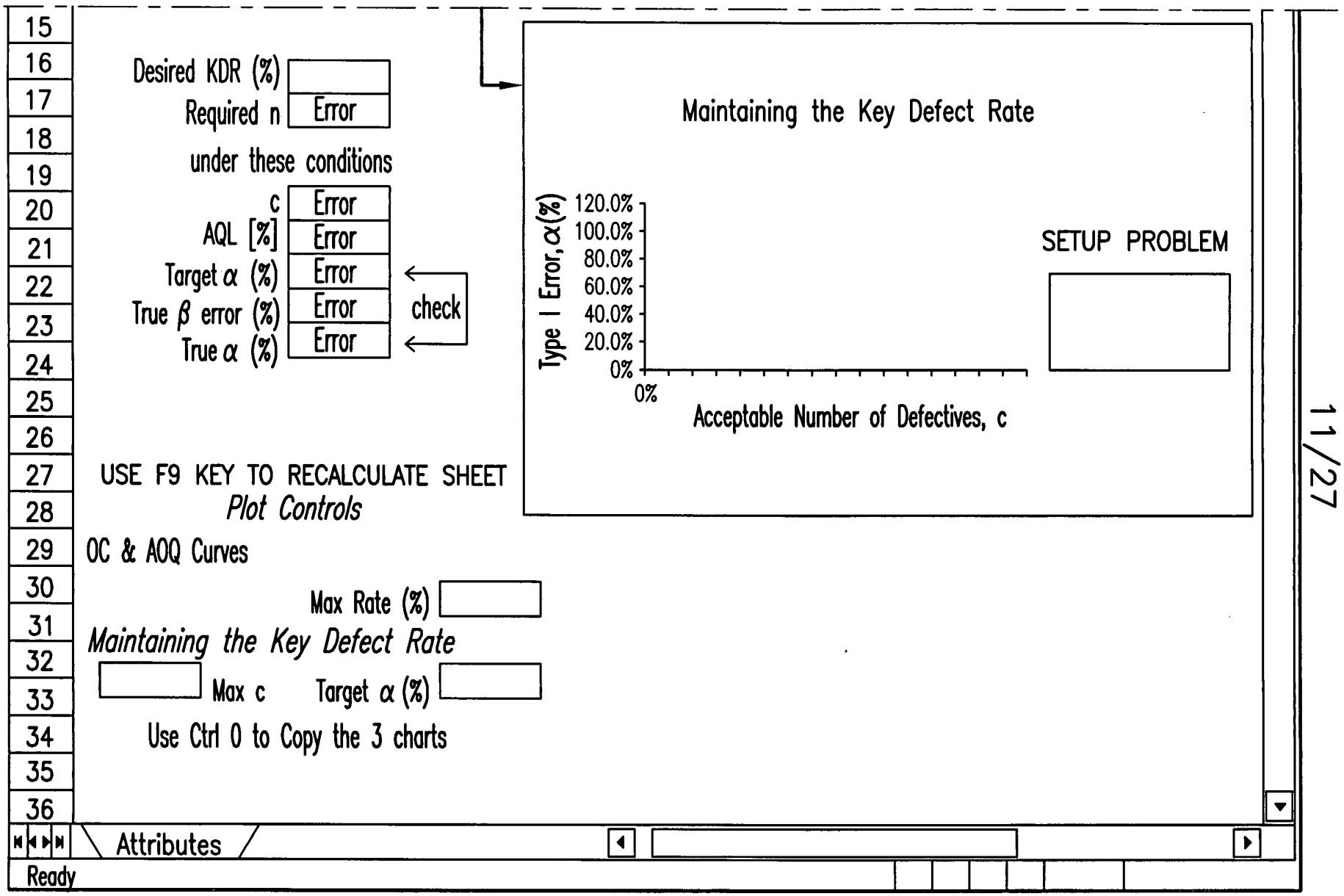
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
Desired KDR (%)
Required n
Error
under these conditions
c
AQL [%]
Target α (%)
True β error (%)
True α (%)
Error
check
USE F9 KEY TO RECALCULATE SHEET
Plot Controls
OC & AOQ Curves
Max Rate (%)
Maintaining the Key Defect Rate
Max c
Target α (%)
Use Ctrl 0 to Copy the 3 charts
Maintaining the Key Defect Rate
Type I Error, α(%)
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0%
0%
Acceptable Number of Defectives, c
SETUP PROBLEM
Attributes
Ready
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FIG.10B

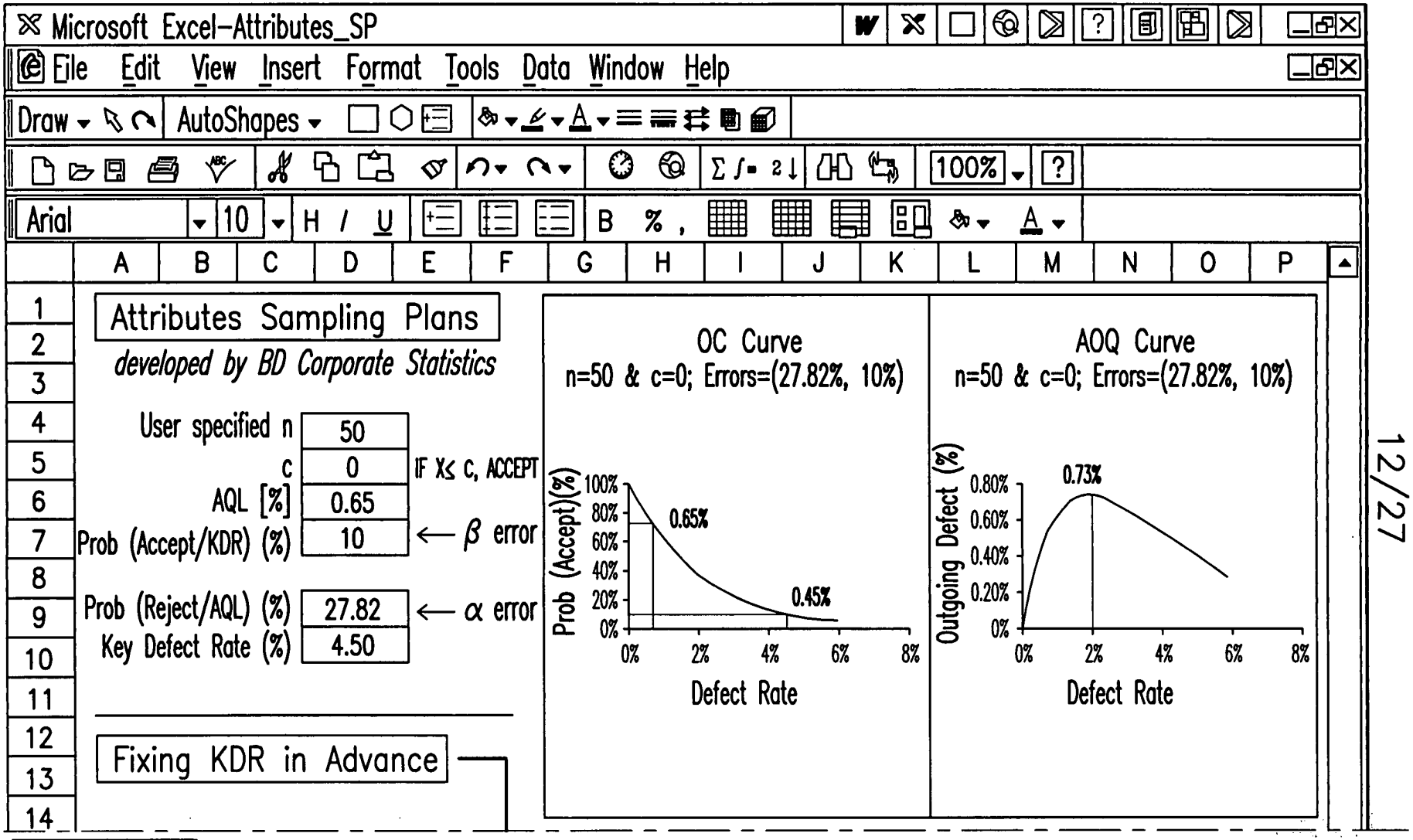

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FIG.11A

FIG.11B

FIG.11A

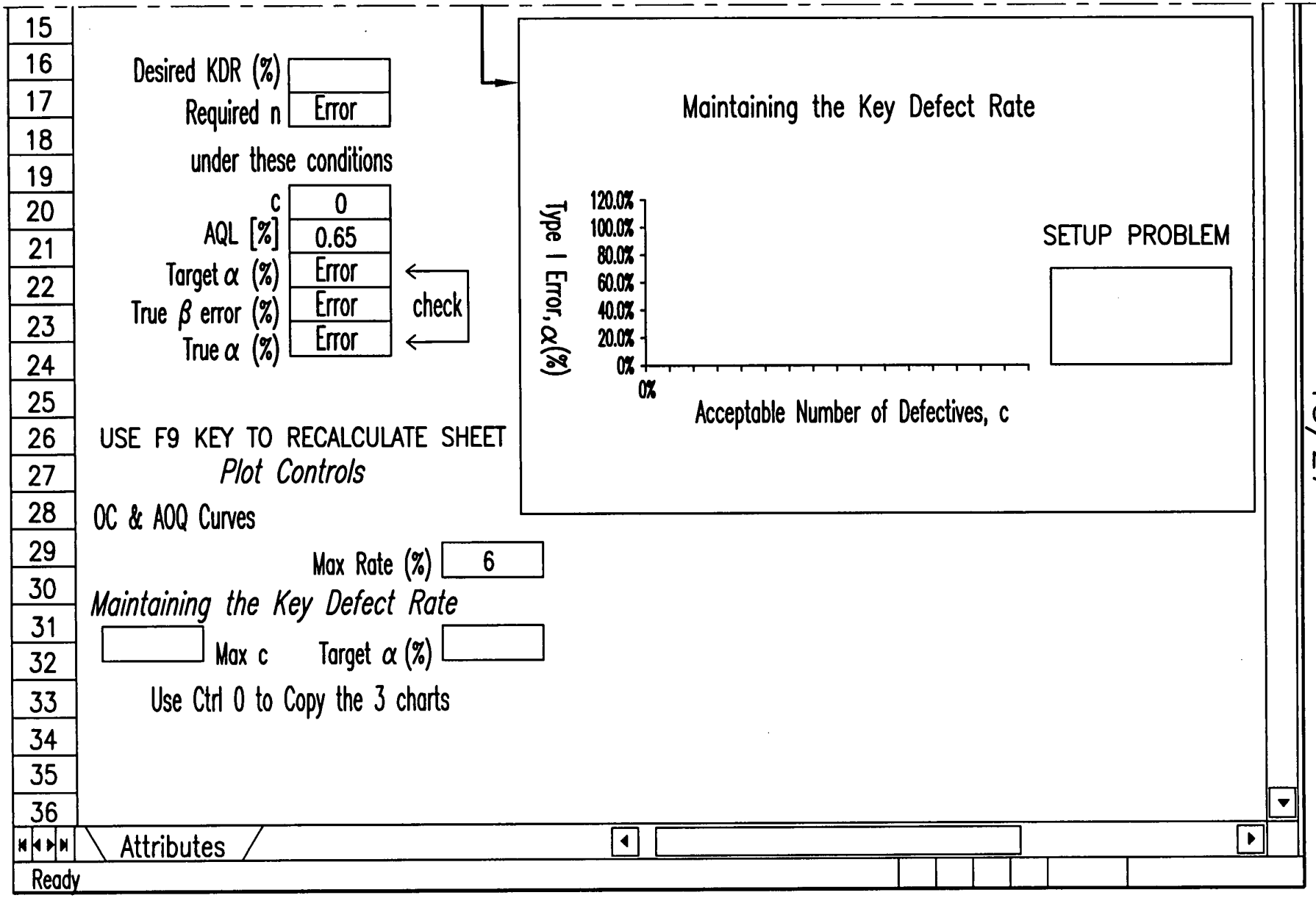
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
Desired KDR (%)
Required n
Error
under these conditions
c
0
AQL [%]
0.65
Target α (%)
Error
True β error (%)
Error
True α (%)
Error
check
USE F9 KEY TO RECALCULATE SHEET
Plot Controls
OC & AOQ Curves
Max Rate (%)
6
Maintaining the Key Defect Rate
Max c
Target α (%)
Use Ctrl 0 to Copy the 3 charts
Maintaining the Key Defect Rate
Type I Error, α(%)
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0%
0%
Acceptable Number of Defectives, c
SETUP PROBLEM
Attributes
Ready

FIG.11B

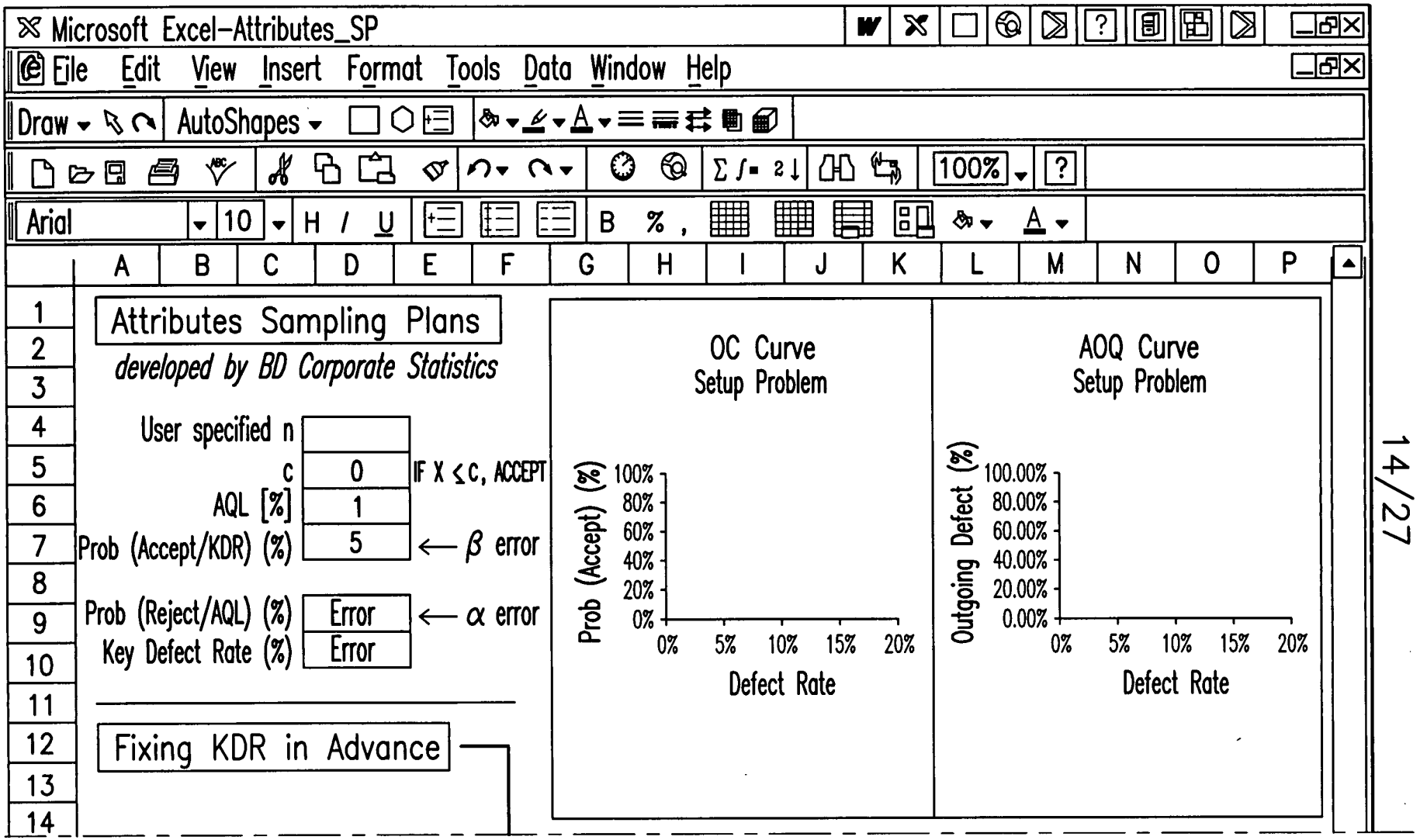

FIG.12A
FIG.12B

FIG.12A

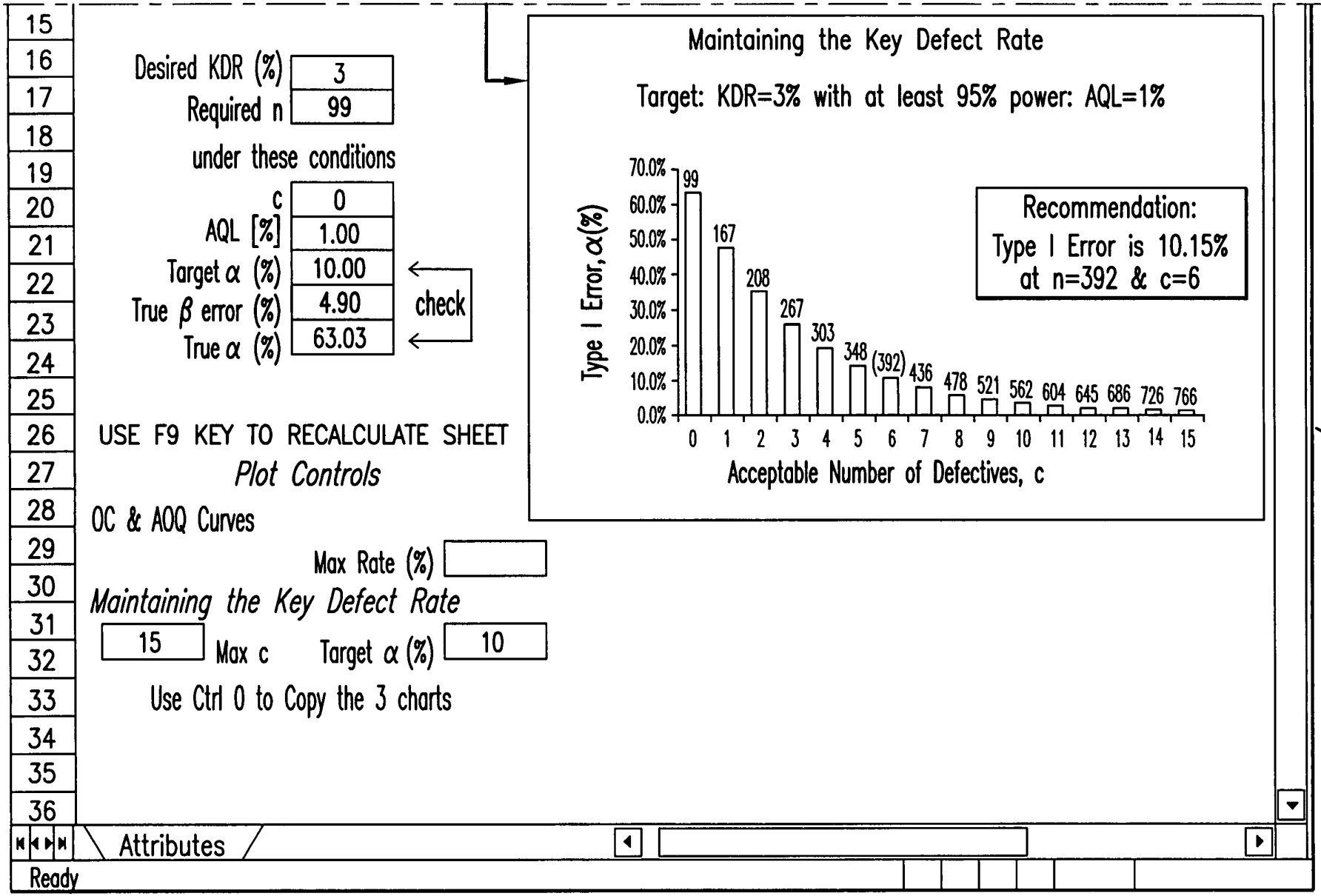
Desired KDR (%) 3
Required n 99
under these conditions
c 0
AQL [%] 1.00
Target α (%) 10.00
True β error (%) 4.90
True α (%) 63.03
check
USE F9 KEY TO RECALCULATE SHEET
Plot Controls
OC & AOQ Curves
Max Rate (%)
Maintaining the Key Defect Rate
15 Max c
Target α (%) 10
Use Ctrl 0 to Copy the 3 charts
Maintaining the Key Defect Rate
Target: KDR=3% with at least 95% power: AQL=1%
Type I Error, α(%)
70.0% 60.0% 50.0% 40.0% 30.0% 20.0% 10.0% 0.0%
99 167 208 267 303 348 (392) 436 478 521 562 604 645 686 726 766
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Acceptable Number of Defectives, c
Recommendation:
Type I Error is 10.15%
at n=392 & c=6
Attributes
Ready

FIG.12B

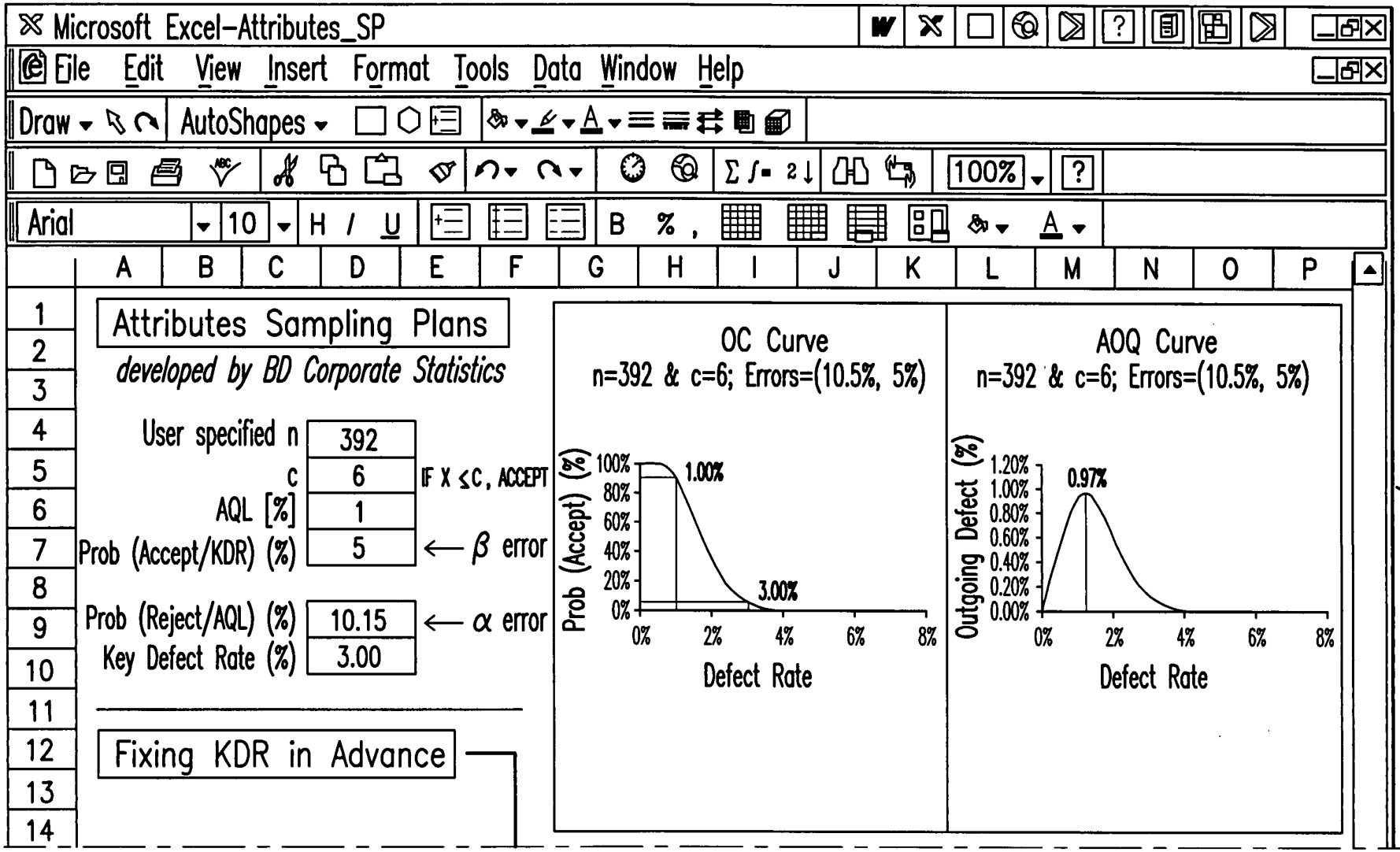

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FIG.13A

FIG.13B

FIG.13A

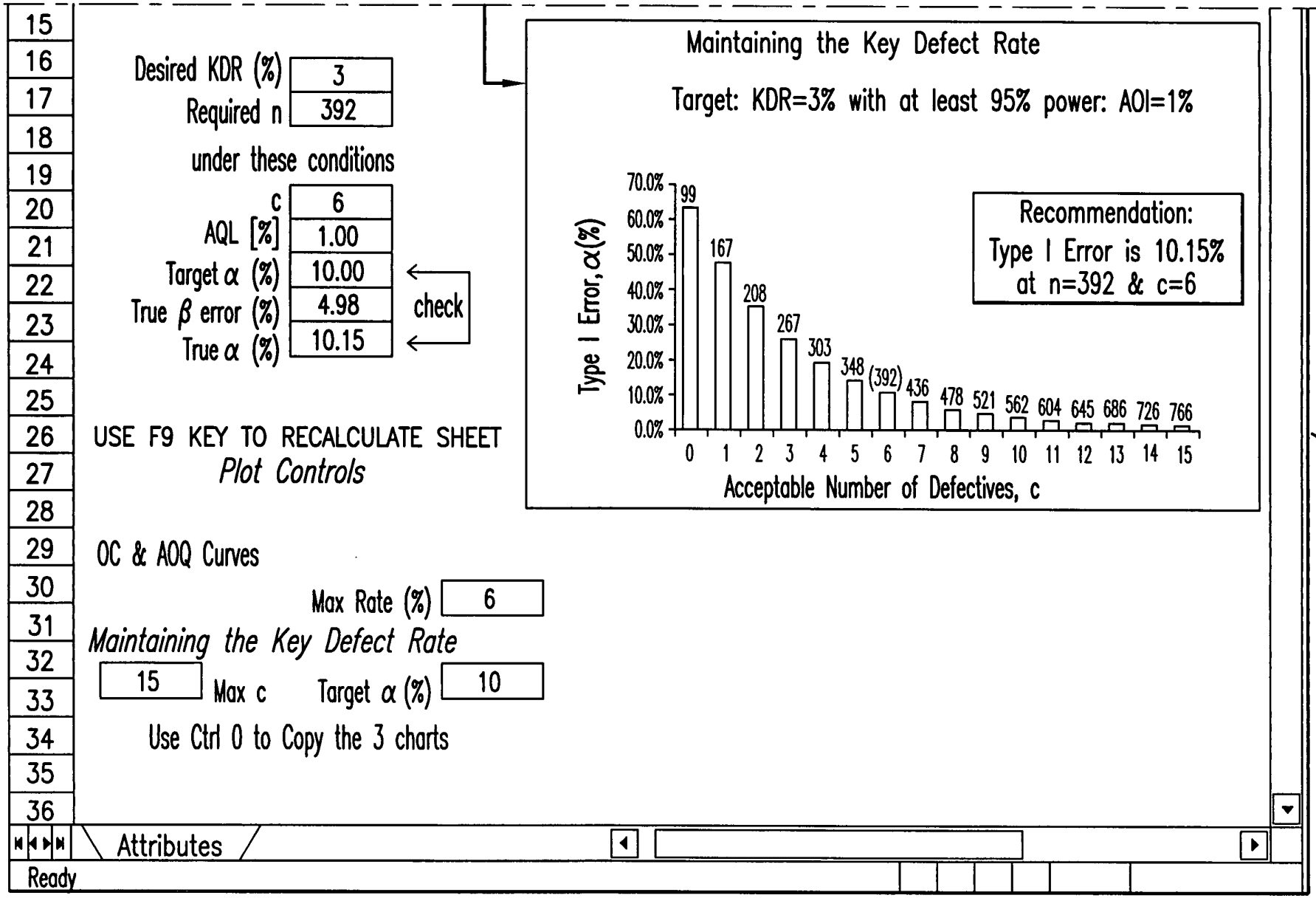
Desired KDR (%) 3
Required n 392
under these conditions
c 6
AQL [%] 1.00
Target α (%) 10.00
True β error (%) 4.98
True α (%) 10.15
check
USE F9 KEY TO RECALCULATE SHEET
Plot Controls
OC & AOQ Curves
Max Rate (%) 6
Maintaining the Key Defect Rate
15 Max c
Target α (%) 10
Use Ctrl 0 to Copy the 3 charts
Maintaining the Key Defect Rate
Target: KDR=3% with at least 95% power: AOI=1%
Recommendation:
Type I Error is 10.15%
at n=392 & c=6
Type I Error, α(%)
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
99
167
208
267
303
348
(392)
436
478
521
562
604
645
686
726
766
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Acceptable Number of Defectives, c
Attributes
Ready

FIG.13B

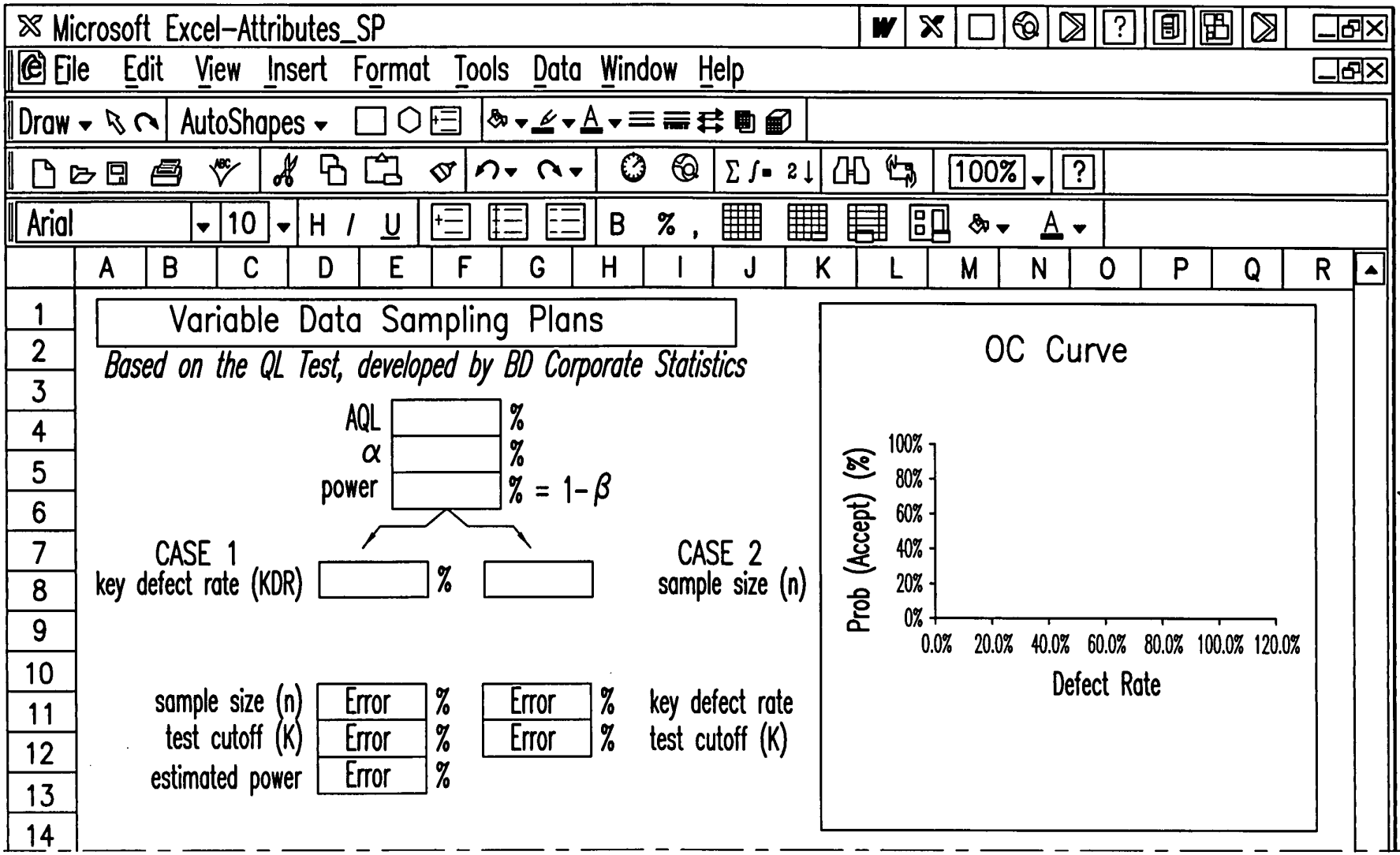

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FIG.14A

FIG.14B

FIG.14A

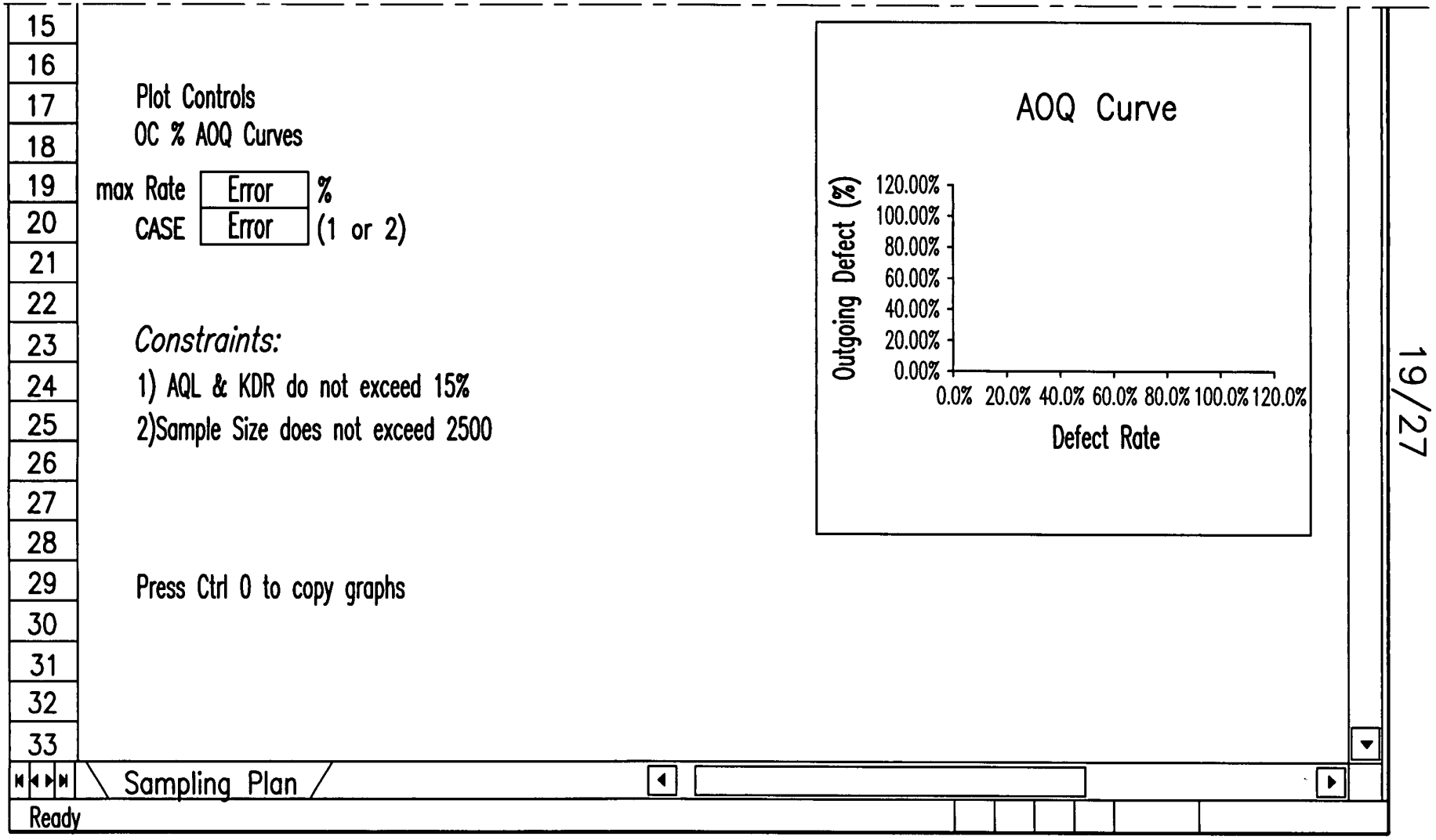
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
Plot Controls
OC % AOQ Curves
max Rate
Error
%
CASE
Error
(1 or 2)
Constraints:
1) AQL & KDR do not exceed 15%
2)Sample Size does not exceed 2500
Press Ctrl 0 to copy graphs
AOQ Curve
Outgoing Defect (%)
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
0.0% 20.0% 40.0% 60.0% 80.0% 100.0% 120.0%
Defect Rate
Sampling Plan
Ready

FIG.14B

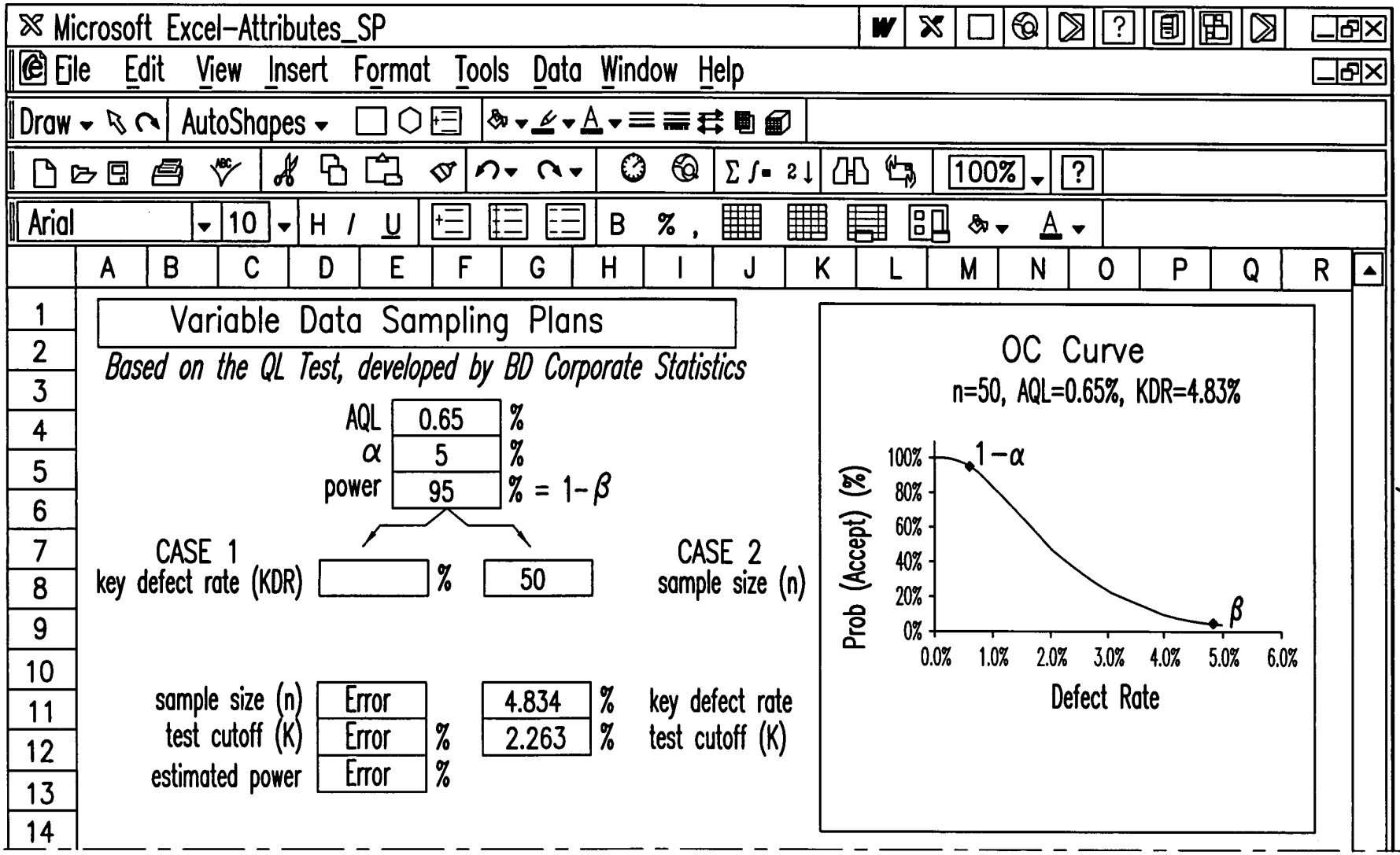

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FIG.15A

FIG.15B

FIG.15A

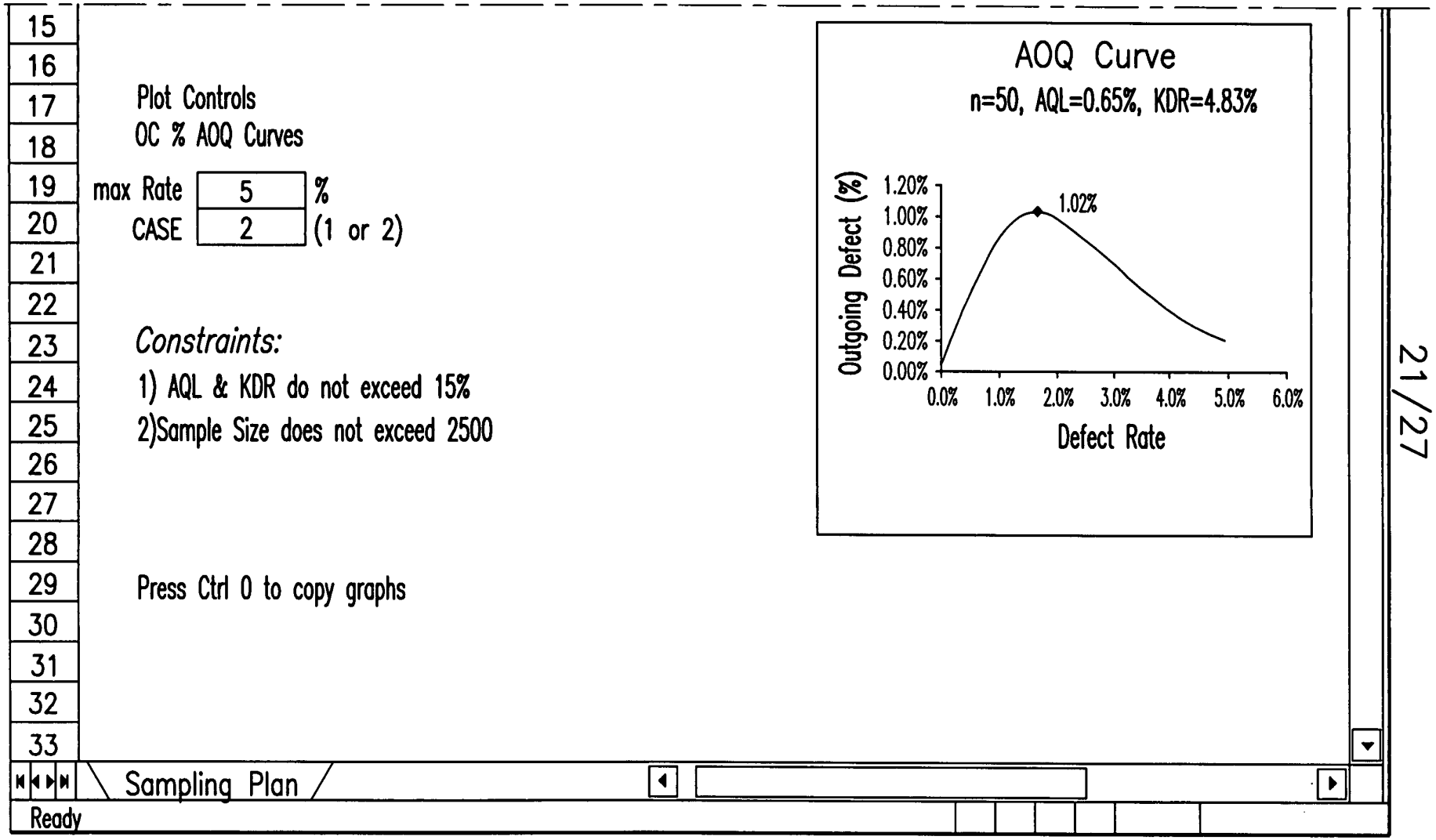
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
Plot Controls
OC % AOQ Curves
max Rate
5
%
CASE
2
(1 or 2)
Constraints:
1) AQL & KDR do not exceed 15%
2)Sample Size does not exceed 2500
Press Ctrl 0 to copy graphs
AOQ Curve
n=50, AQL=0.65%, KDR=4.83%
Outgoing Defect (%)
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
1.02%
0.0%
1.0%
2.0%
3.0%
4.0%
5.0%
6.0%
Defect Rate
Sampling Plan
Ready
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FIG.15B

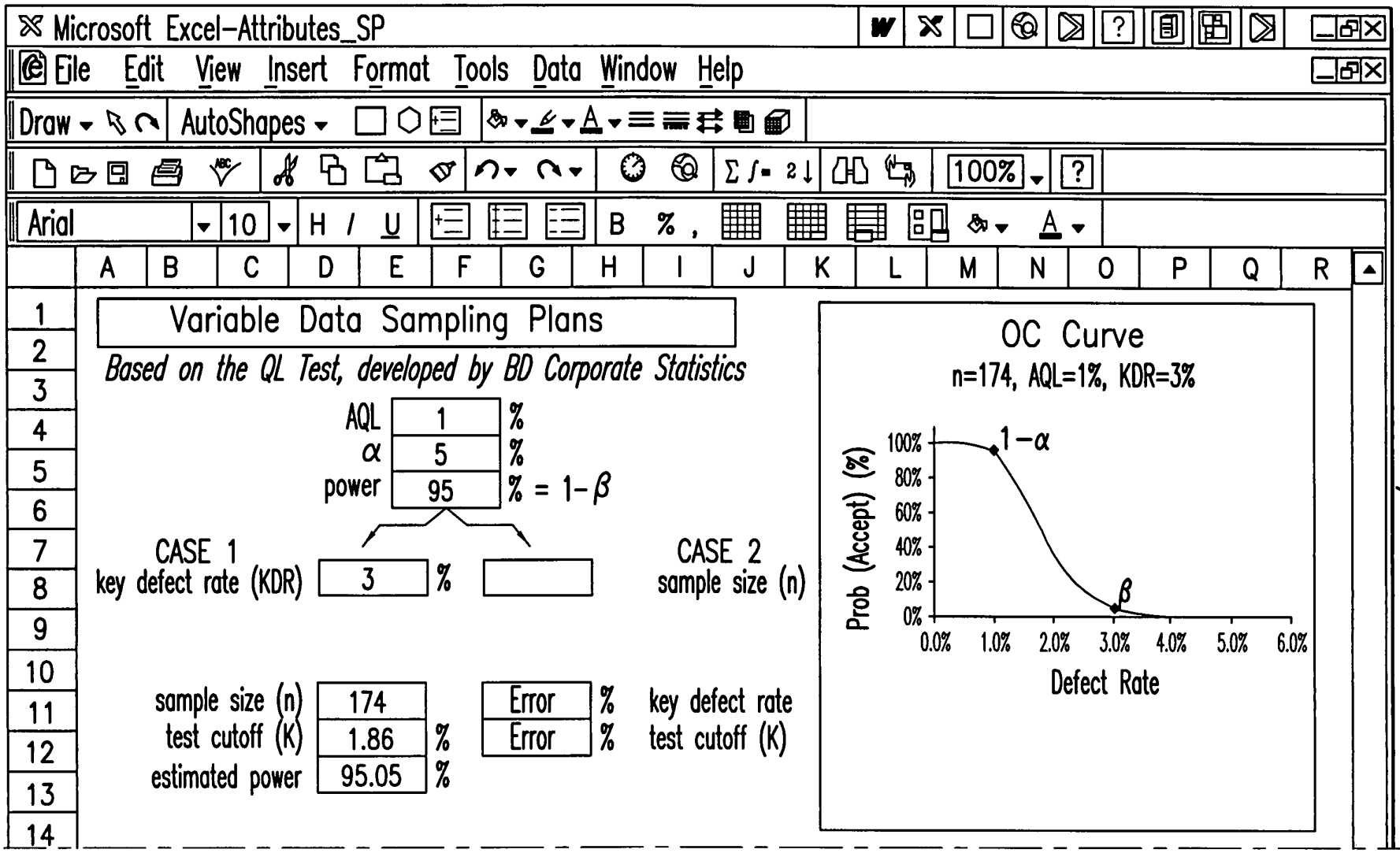

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FIG.16A

FIG.16B

FIG.16A

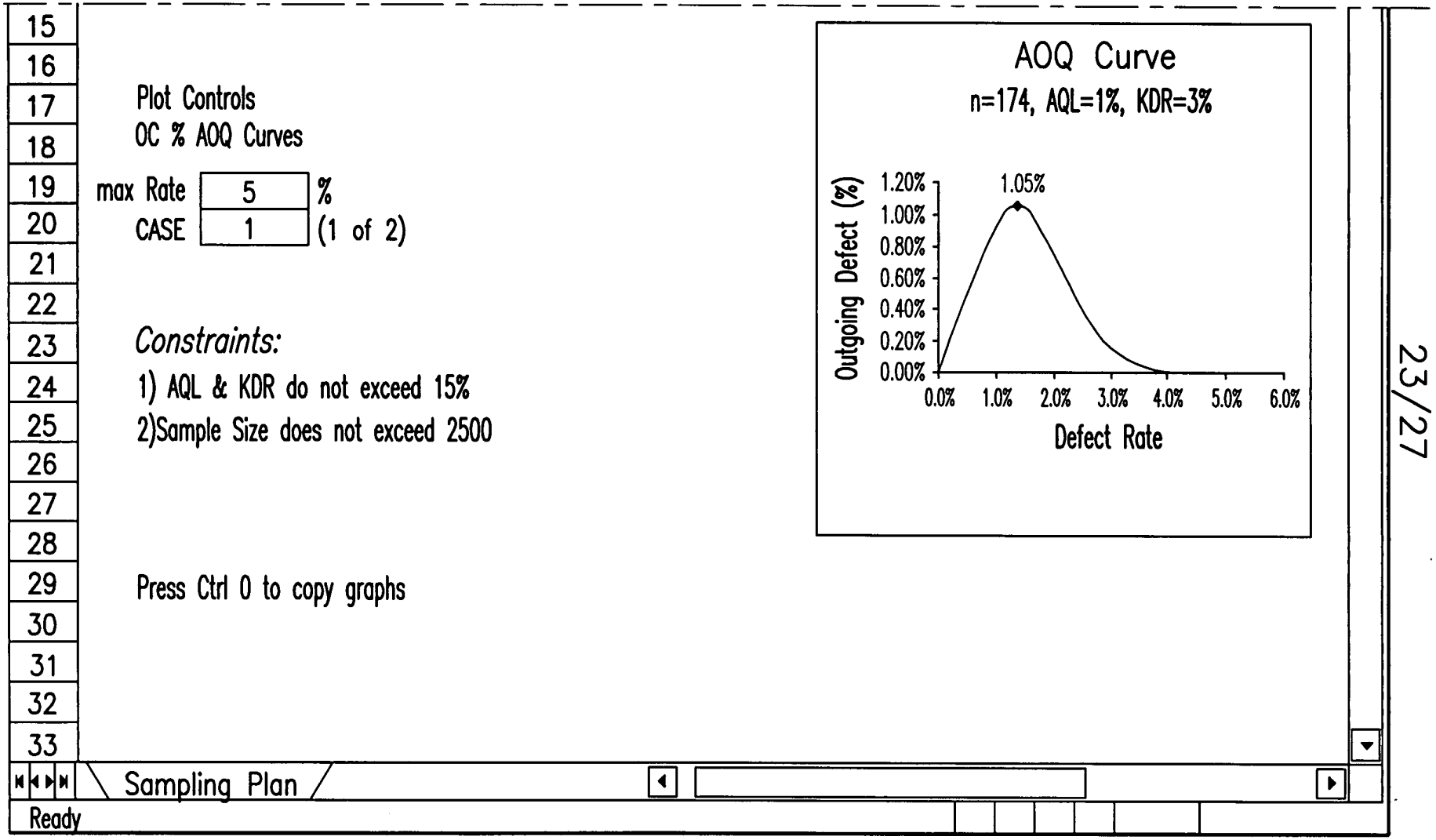
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
Plot Controls
OC % AOQ Curves
max Rate
5
%
CASE
1
(1 of 2)
Constraints:
1) AQL & KDR do not exceed 15%
2)Sample Size does not exceed 2500
Press Ctrl 0 to copy graphs
AOQ Curve
n=174, AQL=1%, KDR=3%
Outgoing Defect (%)
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
1.05%
0.0%
1.0%
2.0%
3.0%
4.0%
5.0%
6.0%
Defect Rate
Sampling Plan
Ready
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FIG.16B

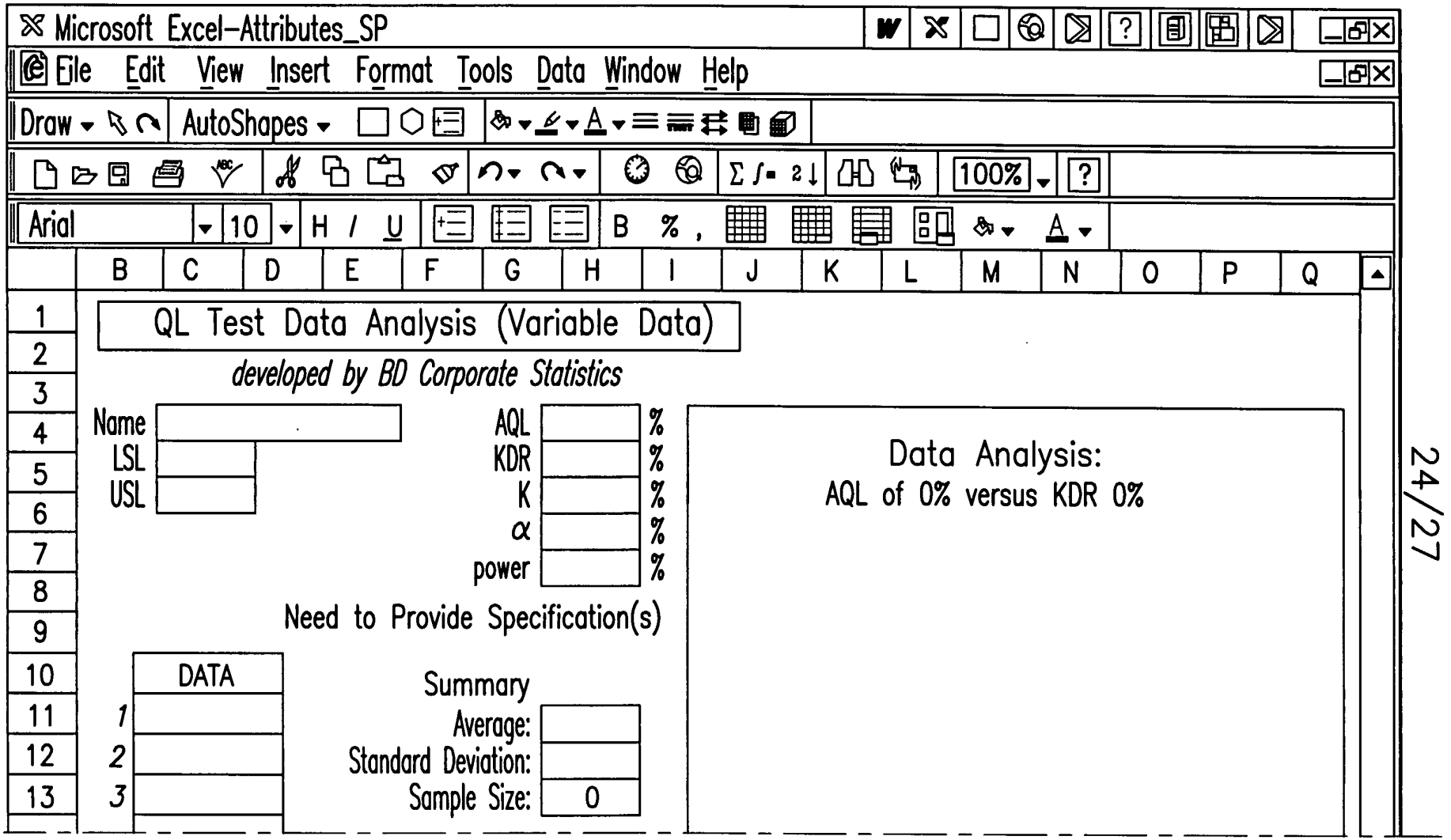

FIG.17A
FIG.17B

FIG.17A

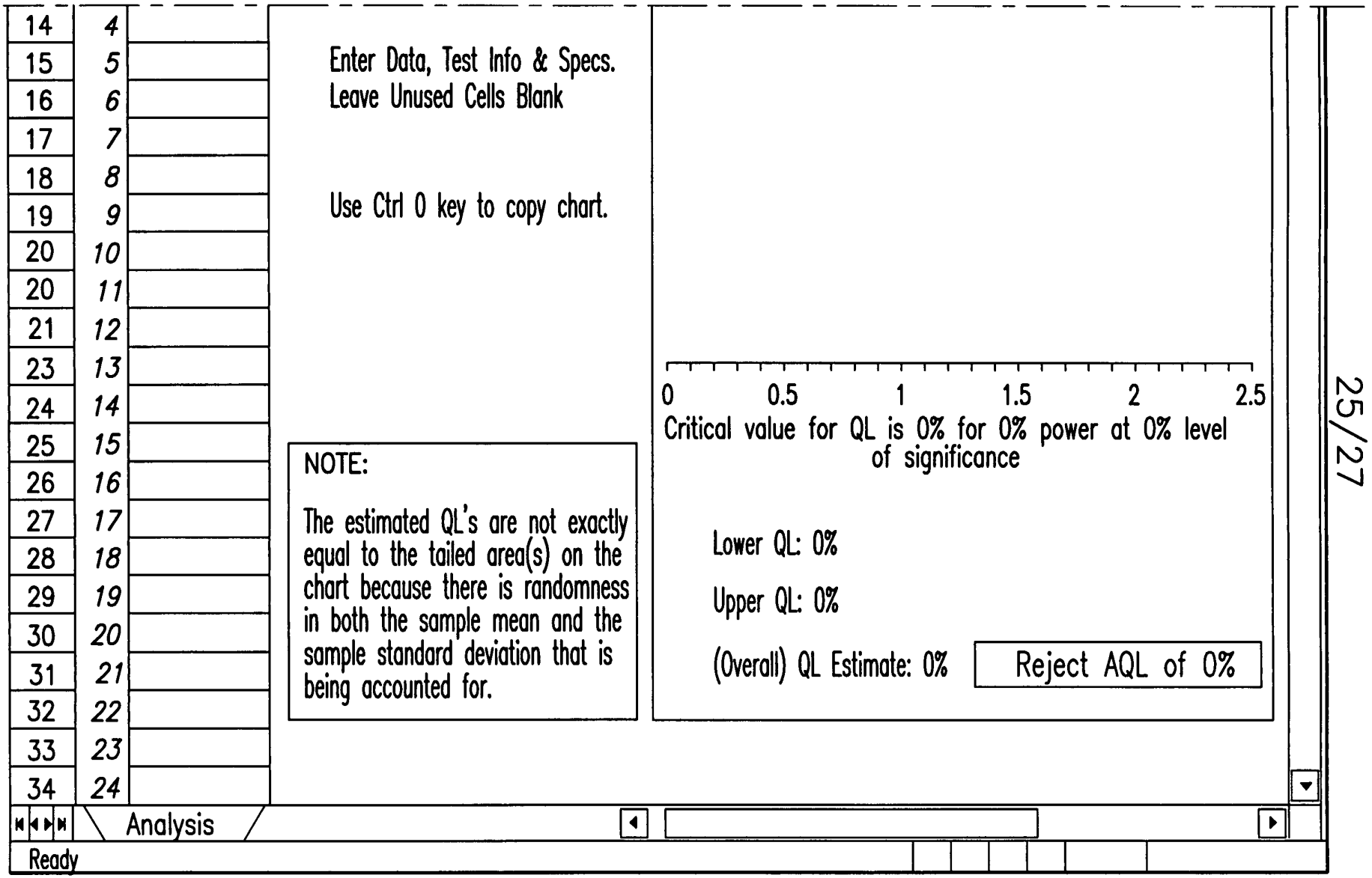
14 4
15 5
16 6
17 7
18 8
19 9
20 10
20 11
21 12
23 13
24 14
25 15
26 16
27 17
28 18
29 19
30 20
31 21
32 22
33 23
34 24
Enter Data, Test Info & Specs.
Leave Unused Cells Blank
Use Ctrl 0 key to copy chart.
NOTE:
The estimated QL's are not exactly equal to the tailed area(s) on the chart because there is randomness in both the sample mean and the sample standard deviation that is being accounted for.
0 0.5 1 1.5 2 2.5
Critical value for QL is 0% for 0% power at 0% level of significance
Lower QL: 0%
Upper QL: 0%
(Overall) QL Estimate: 0%
Reject AQL of 0%
Analysis
Ready
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FIG.17B

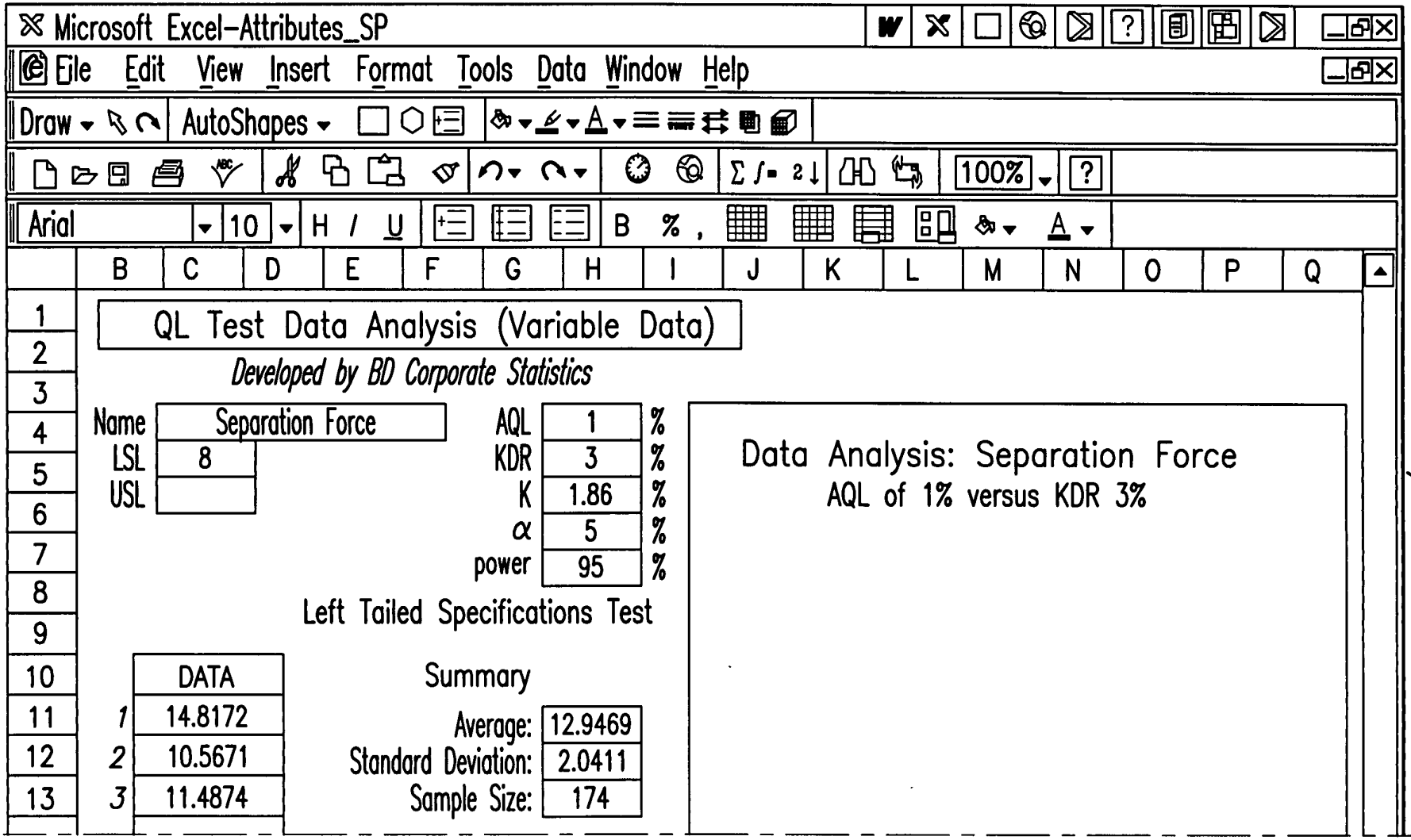

FIG.18A
FIG.18B

FIG.18A

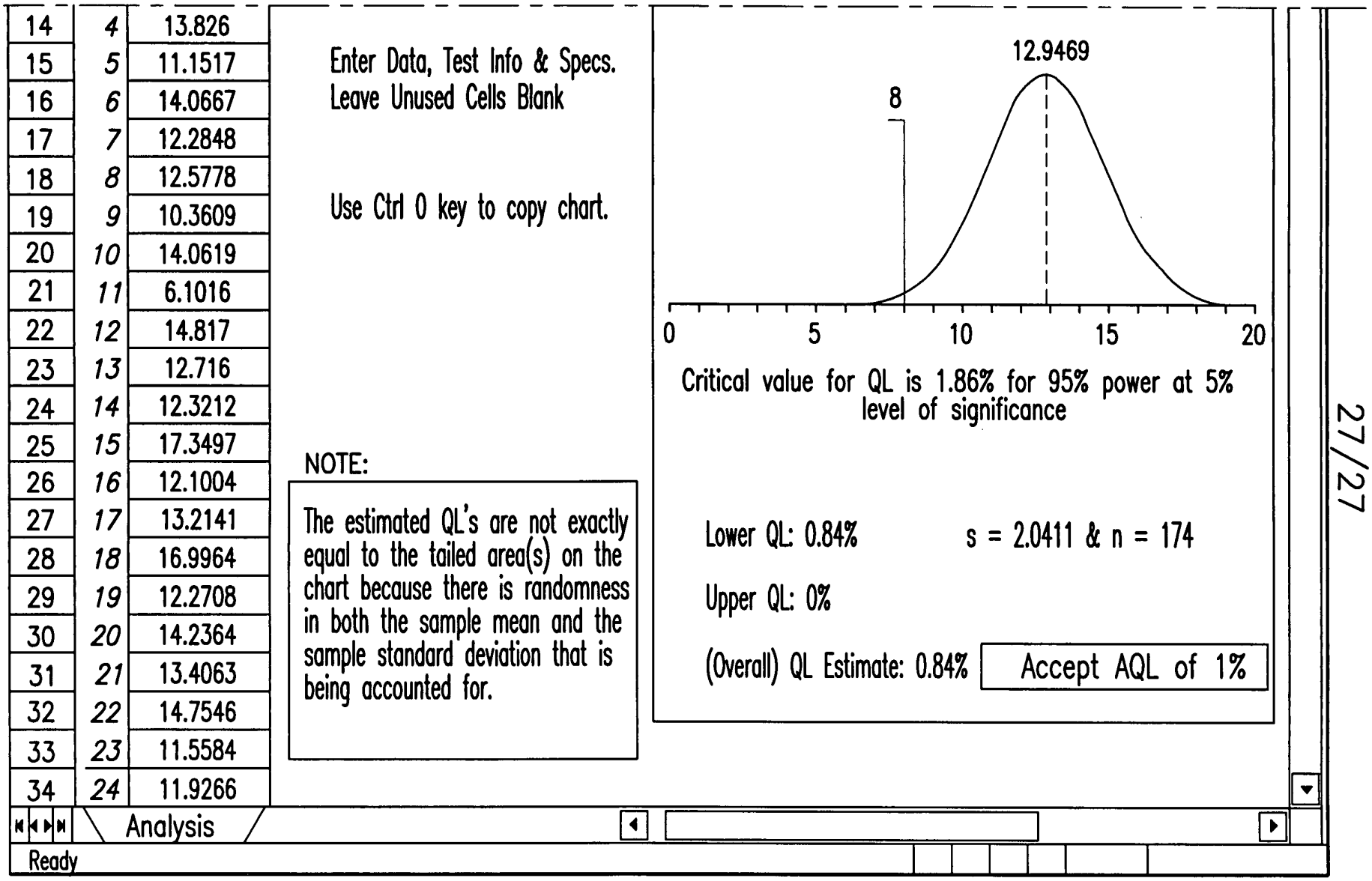
14 4 13.826
15 5 11.1517
16 6 14.0667
17 7 12.2848
18 8 12.5778
19 9 10.3609
20 10 14.0619
21 11 6.1016
22 12 14.817
23 13 12.716
24 14 12.3212
25 15 17.3497
26 16 12.1004
27 17 13.2141
28 18 16.9964
29 19 12.2708
30 20 14.2364
31 21 13.4063
32 22 14.7546
33 23 11.5584
34 24 11.9266
Enter Data, Test Info & Specs.
Leave Unused Cells Blank
Use Ctrl 0 key to copy chart.
NOTE:
The estimated QL's are not exactly equal to the tailed area(s) on the chart because there is randomness in both the sample mean and the sample standard deviation that is being accounted for.
12.9469
8
0
5
10
15
20
Critical value for QL is 1.86% for 95% power at 5% level of significance
Lower QL: 0.84%
s = 2.0411 & n = 174
Upper QL: 0%
(Overall) QL Estimate: 0.84%
Accept AQL of 1%
Analysis
Ready
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FIG.18B